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ORIGINAL ARTICLE

Validation of the Wexner scale in a Hebrew-speaking population

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Abstract

Introduction The Cleveland Clinic Incontinence Score, known as the Wexner Score (WS), is a simple, disease-specific questionnaire for anal incontinence (AI) assessment. We aimed to translate and validate a Hebrew version of the WS.

Methods Between November 2018 and December 2019, the WS was back translated and reviewed by a multidisciplinary pelvic floor team. The questionnaire was filled out by patients visiting the urogynecology and surgical pelvic floor clinics. Two weeks after completion, the patients were contacted using telephone surveys to assess the test-retest reliability examination. Construct validity was assessed by comparing the WS to the Colorectal-Anal Distress Inventory 8 (CRADI-8), a part of the validated Hebrew version of the Pelvic Floor Distress Inventory questionnaire (PFDI-20).

Results Overall, 91 female patients completed the WS questionnaire. Eighty-five percent ($n = 78$) responded to the re-test WS questionnaire. A high intraclass coefficient of 0.87 was found in the WS total score, with a range from 0.82 to 0.86 for its subscales. A significant positive relationship between the Hebrew versions of the WS and CRADI-8 scores was established ($r = 0.66$, $p < 0.0001$).

Conclusion A new, Hebrew-translated version of the WS is a reliable and valid instrument for assessing AI.

Keywords Anal incontinence · Questionnaire · Validation · Translation

Introduction

Anal incontinence (AI), defined as the involuntary loss of flatus and solid or liquid feces, reflects the final common pathway of a multitude of etiological factors, with a reported prevalence of 1.6–15% [1, 2]. AI has a major negative impact on quality of life and daily activities [3] and is often accompanied by severe social restriction.

Although the prevalence of AI is higher in elderly females, young women have also reported AI of up to 62% in various studies [4–6]. Among women of reproductive age, vaginal delivery is the most frequently associated risk factor, reported in approximately 50% of cases with obstetric anal sphincter injury in a long-term follow-up [7–9]. The real prevalence of AI is unknown because of social embarrassment [10]. As underlined in previous studies, only 2.4% to 50% of women reported their AI symptoms prior to being specifically asked through a questionnaire [11–13].

Specific validated questionnaires are essential for the accurate assessment of symptoms' severity prior to selecting an appropriate treatment plan. However, significant variation exists in the way AI is evaluated. A generic and specific questionnaire for symptom assessment of AI has been developed

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and validated. The Cleveland Clinic Anal Incontinence score, also known as the Wexner score (WS), was developed in 1993. This questionnaire has been widely used in clinical and research settings [14, 15] and was translated and validated into several languages [16, 17].

Considering the need for a simple, adapted AI assessment tool for Hebrew-speaking patients, we aimed to validate the Hebrew-translated version of the WS. In addition, we sought to examine the construct validity by assessing the correlation between the WS Hebrew version and the validated Hebrew version of the Colorectal-Anal Distress Inventory 8 (CRADI-8), a part of the PFDI-20, a well-known questionnaire for pelvic floor symptoms.

Materials and methods

This was a prospective study conducted between November 2018 and December 2019 by a multidisciplinary pelvic floor team in a tertiary, university-affiliated medical center. The study was approved by the Institutional Review Board of the Sheba Medical Center (5521–18-SMC, 14/11/2018).

Translation

The WS was translated and validated according to the criteria proposed by Guillemin et al. [18]. Two professional English-Hebrew translators that were not familiar with the questionnaire produced a Hebrew version of the WS. Subsequently, the Hebrew version was reverse translated into English by two linguistic experts. The reversed translations were compared to the original English version. A multidisciplinary team, including bilingual experts in urogynecology, colorectal surgery, and gastroenterology, reviewed the translated questionnaire. No discrepancies were found between the original and back-translated versions.

Validation

Initially, we tested the Hebrew version of the questionnaire on 20 women who completed the WS during their clinic visit. To assure that all participants understood all the components of the WS translation, we regularly asked probing questions, aimed to understand their thought process and ensure comprehension of each component of the scale. Finally, no changes in the translated version were required in this stage of the study. We subsequently performed the "test-retest reliability" of the translation. Two weeks after the clinic visit, the patients were contacted by telephone and were asked to complete the WS questionnaire again. The responses and the internal consistency of the questionnaire were analyzed. After obtaining the results, yielding high internal consistency, we proceeded to the second phase of the validation process by enrolling the final cohort of women that completed both the clinic and the telephone questionnaires.

To assess the construct validity, in other words, whether the Hebrew version of the WS has appropriate relationships with other tests or measures of the same construct [19], we used the Hebrew version of the short form of the Pelvic Floor Distress Inventory questionnaire (PFDI-20) [20, 21]. The Hebrew translation of this questionnaire was previously performed by Lowenstein et al. [22] This questionnaire was designed to assess clinical distress in women with pelvic floor disorders and consists of 20 questions in three scales: urinary distress inventory (6 questions), colorectal-anal distress inventory (8 questions), and pelvic organ prolapse distress inventory (6 questions). The responses are graded from 1 (not at all) to 4 (quite a bit). For the construct validity, only the eight questions of the colorectal-anal distress inventory, the CRADI-8, were used.

Patients

Eligible participants were female patients visiting tertiary urogynecology and colorectal pelvic floor clinics. We included women ≥ 18 years old who provided a signed informed consent. Exclusion criteria were inability to provide informed consent and patients who do not speak fluent Hebrew. The recruitment occurred during the clinical visit. After providing an explanation of the study's objective and design, the women were asked to provide informed consent.

Questionnaire

The WS consists of five questions, three addressing AI (gas, liquid, solid), a coping mechanism (pad wear), and lifestyle alteration. Each question is rated with a score with the following quantifiers: 0 = never; 1 = rarely; 2 = sometimes; 3 = usually; 4 = always. The numerical values are summed to provide a single AI severity score, ranging from 0, which implies no incontinence, to 20, complete incontinence.

Statistical analysis

Characteristics of women were described as proportions for categorical variables and as means and standard deviation for continuous variables. Test-retest reliability was measured using the intra-class correlation coefficient (ICC), and those > 0.70 were considered adequate [23]. Construct validity was calculated using Pearson's correlation test by comparing subscale scores from the WS and CRADI-8 Hebrew questionnaires. All statistical analyses were performed using the IBM SPSS Statistics for Windows, version 25.0, Armonk, NY: IBM Corp.

Results

Twenty women completed the test phase of the translation and validation process. Subsequently, an extra 71 women were enrolled, comprising the full cohort of the study, 91 women. All of the participants completed the WS and PFDI-20 Hebrew version questionnaires' components during the clinic visit, and 78 of them responded to the second telephone WS questionnaire (85.7% response rate).

Baseline characteristics of the study population are depicted in Table 1. The mean age was 57.7 years, all women were literate, and 70.3% were postmenopausal. The following AI parameters were reported by the study's participants (n = 91): gas 58 (63.7%), liquid 47 (51.6%), and solid 35 (38.5%). Twenty-six women (28.6%) had sought prior treatment for AI (diet, biofeedback, or surgery). In addition to AI, 43 (47.3%) women reported symptoms of stress urinary incontinence, 46 (50.5%) of urge incontinence, and 34 (37.4%) had reported mixed urinary incontinence.

The results of the test-retest validity phase are presented in Table 2. The ICC was 0.86 for solid stool loss, 0.82 for liquid stool loss, and 0.83 for gas loss. The pad wear component ICC was 0.84 and that of lifestyle alteration 0.82. The ICC of the WS total score was 0.87.

The results of the construct validity are presented in Fig. 1. We found a statistically significant positive relationship between the Hebrew versions of both the WS and CRADI-8 scores (r = 0.66, $p < 0.0001$). Higher values of the WS correlated with higher values of the PFDI-20, indicating a positive proportional relationship.

Table 1 Characteristics of the study group (n = 91)

Characteristics		
Age	57.65 ± 18.24	
BMI (kg/m^2)	26.28 ± 5.69	
Education		
Primary school	1 (1.1)	
High school	50 (54.9)	
Academic	40 (44.0)	
Deliveries	3 (0–9)	
Vaginal deliveries	2 (0–9)	
Previous vacuum delivery	11 (12.1)	
Previous forceps delivery	4 (4.4)	
Previous obstetric anal injury	13 (14.3)	
Menopausal	64 (70.3)	
Anal incontinence	Yes	No
Gas	58 (63.7)	33 (36.3)
Liquid	47 (51.6)	44 (48.4)
Solid	35 (38.5)	56 (61.5)
Prior AI treatment	26 (28.6)	
Urinary incontinence	Yes	No
Stress	43 (47.3)	48 (52.7)
Urge	46 (50.5)	45 (49.5)
Mixed	34 (37.4)	57 (62.6)

Continuous variables are expressed as mean ± standard deviation or median (range). Categorical variables are presented as number (%)

BMI, body mass index; AI, anal incontinence

Table 2 Internal consistency of the Wexner scale scores (n = 78)

Variable	ICC
Solid	0.86
Liquid	0.82
Gas	0.83
Pad wear	0.84
Lifestyle	0.82
Total	0.87

Analyzed using the intra-class correlation coefficient

ICC, intra-class correlation coefficient

Discussion

In the present study, we translated the WS to Hebrew and validated its properties among Israeli women. Our results show that the Hebrew version of the questionnaire has a high test-retest reliability and internal consistency.

The WS is among the most frequently used tools for AI assessment. It is simple and fast, allowing timely assessment of AI and its impact on quality of life; thus, it is widely accepted in the scientific community. In a survey among clinicians and researchers, it was the most commonly used tool (48.8%) [15]. However, its use in the Hebrew-speaking population has been impeded by lack of a validated version. Nevertheless, it is widely used among Israeli clinicians, in various self-translated, and invalidated, forms. To the best of our knowledge, prior to the current study, the PFDI-20 was the only questionnaire comprising an AI component that was translated and validated in Hebrew [22].

The WS has been previously validated in a non-English speaking population. Cam et al. validated the questionnaire in a Turkish population and found high internal consistency and a strong correlation when comparing the WS to manometric measurements [16]. Fonseca et al. validated the WS in a Brazilian population by comparing the translated version to the Fecal Incontinence Quality of Life (FIQL) questionnaire and implementing a telephone call for test-retest validity in a method similar to ours. They found a high level of intra-class correlation coefficient and internal consistency [17]. Telephone administration of quality of life instruments for

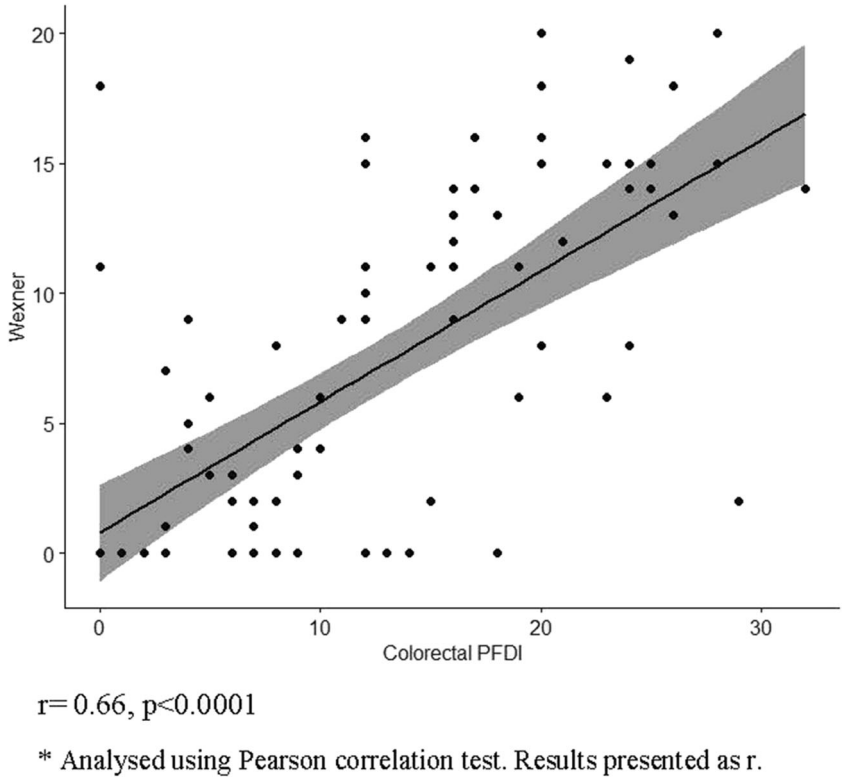

Fig. 1 Pearson's correlation between the Wexner scale and colorectal-anal distress inventory

the assessment of pelvic floor disorders, as used by Fonseca et al. and in the present study, was previously shown to be reliable and accurate [24]. The use of this tool in our study served to facilitate the access to the participants, some of which are elderly and of limited mobility.

The PFDI-20, serving to construct validity in our study, includes eight questions focusing on gastrointestinal symptoms, the CRADI-8. Three of the questions assessing AI in this inventory correlate with three questions in the WS (solid, liquid, gas), allowing comparison of the two inventories. However, the WS includes frequency and coping mechanism questions not included in the PFDI-20. These differences, along with the WS relative simplicity, are the main advantages of this inventory in settings requiring rapid assessment of AI. In turn, the PFDI-20 includes bladder and pelvic floor prolapse symptoms, which are not present in the WS.

Our study has some limitations. Of the original population that completed the questionnaire in the first visit, only 85.7% responded to the validation phase, thus potentially lowering the test-retest validity. Second, as all participants completed the first WS in the clinic visit, and 2 weeks later by telephone, we cannot recommend a different method of validation. Third, this study was not structured to assess the responsiveness of the Hebrew translation of the WS and cannot comment on it. Among the strengths is the fact that all participants were literate and able to read and listen to the WS, potentially increasing the validity of our translation. Second, the use of the colorectal inventory of the Hebrew translation of the PFDI-20 and comparison to the WS serve as a second validation of this translated questionnaire. Finally, our study population comprised patients that were recruited from both our urogynecology and colorectal clinics, each treating a different spectrum of patients with common symptoms. The patients in the urogynecology clinic are younger, with a higher incidence of post-delivery complications, while the colorectal clinic population is older and suffers from other gastrointestinal symptoms. This design strengthens the generalizability of our findings.

In conclusion, the current translation of the WS to Hebrew is reliable and valid and can serve to promote treatment and research in the pelvic floor field. The translated version can be found online (colon.doctorsonly.co.il, www.iugs.org.il).

Author contributions R Meyer: Project development, data collection, manuscript writing.
M Alcalay: Project development, data collection, manuscript writing.
R Jamal: Data collection, manuscript revision.
N Horesh: Data collection, manuscript writing.
T Friedman: Data collection, manuscript revision.
R Nadler: Manuscript writing.
D Carter: Data collection, manuscript revision.
E Ram: Project development, data collection, manuscript writing.

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Compliance with ethical standards

Conflict of interest None.

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